



Threat to Earth from supernova blast falls

Wednesday, 4 December 2002

The likelihood of a supernova explosion that would strip off the Earth's protective ozone layer for decades and imperil life has been reduced to a remote threat, according to new calculations by American astrophysicists.

The new study, to be published in the March 2003 issue of the *Astrophysical Journal*, has calculated that a supernova blast would not be as damaging, and its range would be lower, than first thought.



Supernova blasts like this in 1987 are not as threatening to life as feared (Pic: AAO)

To damage our ozone layer, a star would have to go supernova within 25 light years of Earth, which dramatically reduces the chances of an event to once every 700 million years or so. What's more, there are no stars likely to go supernova within a 25 light-year radius, the authors said.

Previously, scientists had calculated that a supernova could be 50 light years away and still emit enough gamma rays and other cosmic radiation to erase most of our ozone layer for decades, exposing the Earth's surface to harmful ultraviolet light from the Sun and damaging cosmic rays from space.

Some scientists have suggested that supernova blasts may have played a part in past extinction events on Earth.

Dr Neil Gehrels of NASA's Goddard Space Flight Centre in Maryland, USA, and colleagues used a detailed computer model of the atmosphere to gauge how nitrogen oxides - created by gamma rays striking the top layers - would destroy ozone.

"They found the effect was much less significant than was previously estimated," said Dr Chris Tinney, the head of astronomy at the Anglo-Australian Observatory in Sydney. "The [supernova] would have to be twice as close to have the same effect."

The NASA group was looking at one of the ways supernova might wipe out life on Earth. After a supernova occurred, high energy radiation would hit our atmosphere, catalysing and breaking down ozone. "It essentially would de-stabilise our own biosphere, to the point [where] it would have a significant impact," Tinney told ABC Science Online.

Since the original calculations were made in the 1970s, astronomers have learnt a lot more about supernovae, said Tinney. Astronomers have

Recent News in Science

Editorial: The good, the useful and the quirky
Moving organs help plants endure strong light
Curse of Tutankhamen finally laid to rest

Archive

Monthly News in Science

More on Science

The Lab's Summer Reading Guide
Lightning Storms in the Top End
The Future Without Shakespeare
Bogongs Migrating South

Breaking Sci-Tech News:

Science used to determine moths' origins
Environmental researchers seek more responsive data
ABA clears anti-WTO websites
New approach improves leukaemia treatment
Zambia rejects GM food aid

since debated how much radiation supernovae produce, how the rays damage the atmosphere and how often stars explode nearby.

The NASA researchers used the energy from Supernova 1987A to make their new calculations. The supernova was the first ever detected since modern telescopes were invented, and appeared in the sky in early 1987.

They found that to thin the ozone layer enough to allow twice as much ultraviolet light to reach the surface, a star would need to explode within 25 light years of Earth.

"Twenty-five light years is very close," said Tinney. "We know all the stars within 25 light years, and we know that none are massive enough to go off [in a supernova]. So the number of possible supernovae that can do this has been reduced to none."

Only a particular type of star - one that is near the end of its life and above a certain mass - can go supernova. "You are in more danger of being hit by a bus," said Tinney.

Danny Kingsley - ABC Science Online

More Info?

Rogue black hole shot out by supernova, News in Science 19 Nov 2002

Holy Supernova, Catalyst - ABC TV, 5 Sept 2002

Universe finds its dark side, News in Science 3 Apr 2001

Pulsars lie about their age, News in Science 13 Jul 2000



Print-friendly version

More News...

Recent News in Science . Archive . ABC Online News



© 2002 ABC | Privacy Policy